Patent
Attorney's Docket No. 032498-010

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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| In re Patent Application of | ) | |
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| Paul LÜCHINGER | ) | Group Art Unit: Unassigned |
| | ) | |
| Application No.: Unassigned | ) | Examiner: Unassigned |
| | ) | |
| Filed: January 10, 2002 | ) | |
| | ) | |
| For: CALIBRATION APPARATUS FOR MULTI-CHANNEL PIPETTES, INCLUDING A TRANSPORT FOR RECEPTACLES | ) | |



**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination, kindly amend the above-identified application as follows:

**IN THE ABSTRACT:**

Please replace the Abstract as attached to this response.

**IN THE SPECIFICATION:**

Please amend the specification as follows:

Page 1, Paragraph Beginning at Paragraph No. 0001

BACKGROUND

--Field Of The Invention:--

**[0001]** The invention relates to an apparatus to calibrate multi-channel pipettes by means of a measuring device, and it also relates to a device for transporting receptacles containing a test liquid to a measuring device.

--Background Information--

**[0002]** Pipettes are instruments for transferring defined amounts of liquids from one container to another and are used in particular in laboratories. The dispensing of liquids by means of pipettes is often the first step in a series of analytical experiments. Multi-channel pipettes are particularly efficient to work with, because they allow liquid to be aspirated simultaneously from one or more containers and to be dispensed into several receptacles at once. It is of particular importance that the volume of liquid taken in and dispensed to other containers is the same in all channels. In view of the strict requirements on the accuracy of the transferred volume, pipettes used for the foregoing purpose, especially multi-channel pipettes, have to be tested several times in the course of a year. In addition, verification tests of pipettes are required under official guidelines and international standards. A verification test is often referred to as a calibration.

Page 3, Paragraph Beginning at Paragraph No. 0006

--SUMMARY OF THE INVENTION--

**[0006]** The present invention therefore has the objective of providing an apparatus for the gravimetric calibration of multi-channel pipettes with a transport device that advances the receptacles to the measuring device. The apparatus should have an uncomplicated design that causes no loss of precision of the calibration measurements, can be realized at a favorable cost, and has a faster operating speed, so that a multi-channel pipette can be calibrated in a reasonable amount of time.

**[0007]** An apparatus for the gravimetric calibration of multi-channel pipettes according to the present invention contains a balance that has a load receiver configured to support receptacles containing a substance to be weighed. The apparatus has a holder device to support a certain number of the receptacles into which a test liquid is dispensed from the multi-channel pipette. The apparatus further has a transport device for advancing the holder device towards the load receiver. The receptacles are seated in the holder device at equally spaced positions with a defined distance from each other. The transport device has means whereby one after another of the receptacles can be delivered to and subsequently removed from the measuring device.



Page 6, Paragraph Beginning at Paragraph No. 0023

**[0023]** In the attached drawing:

**[0024]** Fig. 1 represents an overall view of an exemplary transport device according to the invention;

**[0025]** Fig. 2 represents an exemplary embodiment of a holder device for receptacles in a perspective view;

**[0026]** Fig. 3 represents a top view of four different exemplary embodiments of receptacles A through D with their suspension members;

**[0027]** Fig. 4 represents a perspective view of an exemplary alternative design of the suspension members, particularly suitable for narrow receptacles;

**[0028]** Fig. 5 represents a perspective view of an exemplary transport rack and transport container, shown spatially separated from each other;

**[0029]** Fig. 6 represents a sectional view of an exemplary embodiment of a load receiver inside the holder device with a receptacle in place;

**[0030]** Fig. 7 represents an exemplary embodiment of the drive mechanism at a lowest position of a transport movement;

**[0031]** Fig. 8 illustrates in a detail view from the side an exemplary manner by which an exemplary transport device and load receiver work together;

**[0032]** Fig. 9 represents a cross-sectional view of an exemplary holder device;

**[0033]** Fig. 10 represents an exemplary integrated code reader arrangement near the load receiver, with code markings attached to the bottoms of the receptacles; and

**[0034]** Fig. 11 represents a perspective view of an exemplary transport device with a bar code marking on the holder device and a bar code reader mounted on the transport device.

Page 7, Paragraph Beginning at Paragraph No. 0035

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

**[0035]** An apparatus for the gravimetric calibration of multi-channel pipettes includes an electronic balance with a load receiver, a holder device, and a transport device for receptacles. Fig. 1 illustrates a transport device 1 with a housing 2, and a transport channel 5 running along the center of the housing 2. Transport racks 7 run near the top of the inward-facing side walls 3 of the channel 5. The bottom side 4 of each transport rack has a profile resembling a sine wave with truncated wave tops. The sine-wave profile could for example be formed as a machined recess in each side wall 3, in which case the

latter would be made of a thicker material. Alternatively, the sine-wave profile could be part of a rail that is set into the side wall 3. The transport rack 7 is delimited at the top by an upper rack profile 6 in the shape of arches, with the highest points of the arches lying opposite the truncated wave tops of the bottom side 4. A transport carriage 8 is movable in the transport channel, guided by the transport racks 7, as will be described in more detail in the context of Fig. 5. A holder device 10, which could also be called a holding frame, has a foot portion 11 that is seated with a snug fit in a seat 12, e.g. a cut-out, of the transport carriage 8. No additional fastener device is needed to keep the holder device 10 positioned on the transport carriage 8. A cover 9 is set over the holder device 10.

**[0036]** Fig. 2 gives a perspective view, looking from above at an oblique angle at the holder device 10 with the receptacles 13 for the test medium (usually water). In addition, Fig. 2 also shows the cover 9, likewise in perspective, looking at the underside of the cover 9. The holder device 10 includes an oblong T-shaped arrangement of three major parts. The side walls 14 extend from the foot portion 11 almost to the upper edge of the holder device 10. Tubs 15 are arranged on the outside of both side walls 14. The tubs 15 are filled with the same liquid as is used to test the pipettes (normally water), or they contain water-saturated sponges. Their purpose is to saturate the air inside the holder device 10 with humidity to counteract the evaporation of the test liquid in the receptacles 13. A humidity sensor installed close to the tubs 15 may be used to verify the degree of saturation. The side walls 14 have serrated upper rims forming a holder rack 16. The tips 17 and triangular indentations 18 in the rim of one side wall 14 are symmetrically aligned with the tips and indentations of the other side wall 14. The indentations of the holder rack

16 serve as seats for the receptacles 13. The latter are suspended by means of suspension members 19, 19' that are seated in the indentations 18 of the holder rack 16. A series of receptacles 13 are seated in this manner one after the other in adjacent indentations. The holder device 10 is open at the bottom. However, if the holder device 10 is set down on a plane surface, e.g., on the floor 60 of the transport channel (see Fig. 1), the bottom of the holder device 10 is closed off so that no air, and thus no humidity, is exchanged with the ambient atmosphere.

**IN THE CLAIMS:**

Please amend the claims as follows:

1. (Amended) An apparatus for gravimetrically calibrating a multi-channel pipette, comprising:

a balance with a load receiver configured to support one of a plurality of receptacles;

a holder device configured to hold the plurality of receptacles, said receptacles being seated in the holder device at defined equal intervals from each other and arranged so that the receptacles can be filled with a test liquid from pipette tips of the multi-channel pipette; and

a transport device for transporting the holder device to the load receiver, wherein the transport device has means for placing on and subsequently removing from the load receiver one after another of said receptacles.

2. (Amended) The apparatus of claim 1, wherein at least one of the transport device and the holder device has means for precisely positioning the receptacles on the load receiver.

3. (Amended) The apparatus of claim 1, wherein the transport device is encased in a housing, the balance is installed in the housing, and the load receiver is arranged on a surface of the balance and passes through an opening of the housing into the holder device, when the holder device is in a working position on the transport device.

4. (Amended) The apparatus of claim 1, wherein the load receiver has two wings with V-shaped depressions formed at ends of the wings, from which said one of the plurality of receptacles can be suspended.

5. (Amended) The apparatus of claim 1, wherein the defined equal intervals correspond to a tip interval at which the pipette tips of the multi-channel pipette are spaced from each other.

6. (Amended) The apparatus of claim 1, wherein the plurality of receptacles in the holder device has at least as many receptacles as the multi-channel pipette has pipette tips.

7. (Amended) The apparatus of claim 1, wherein the receptacles have a geometrically shaped cross-section of one a circle, oval and rectangle.

8. (Amended) The apparatus of claim 1, wherein the holder device comprises:

a holder rack with indentations in which the receptacles are seated by means of rigid suspension members that are attached to upper ends of the receptacles.

9. (Amended) The apparatus of claim 8, wherein the rigid suspension members comprise:

sockets that partially surround a circumference of each receptacle, and rod members with an inner cone and an outer cone.

10. (Amended) The apparatus of claim 9, wherein at least one of the rod members has a double cone which includes two cones pointing in opposite directions, located between the inner cone and the outer cone, and forming a ring groove at a transition from the double cone to the outer cone, said ring groove serving to positively seat one of the rigid suspension members in one of the indentations of the holder rack.

11. (Amended) The apparatus of claim 1, wherein the holder device is separable from the transport device.

12. (Amended) The apparatus of claim 1, wherein the holder device has a cover as a barrier against contamination and evaporation.

13. (Amended) The apparatus of claim 1, wherein the holder device has at least one tub near openings of the receptacles, wherein the tub can be filled with the test liquid to create a saturated atmosphere in the holder device to reduce evaporation of the test liquid from the receptacles.

14. (Amended) The apparatus of claim 1, wherein the holder device has means whereby an underside of the holder device is sealed when the holder device is set on a flat surface.

15. (Amended) The apparatus of claim 1, wherein the transport device is operable to move the holder device horizontally back and forth while at the same time raising and lowering the holder device.

16. (Amended) The apparatus of claim 15, wherein the transport device is configured to move the holder device back and forth with simultaneous raising and lowering with a single drive source.

18. (Amended) The apparatus of claim 1, wherein the transport device has a transport carriage and a transport channel in which the transport carriage moves, and wherein the transport carriage has a seat for the holder device.

19. (Amended) The apparatus of claim 1, wherein the transport

device comprises:

at least one transport rack guiding movements of the holder device.

20. (Amended) The apparatus of claim 1, wherein the transport device comprises:

a position sensor operable to determine an actual position of one of the holder device and a transport carriage of the transport device in relation to the transport device.

21. (Amended) The apparatus of claim 16, comprising:

a drive mechanism, a housing, a drive wheel with at least two bolts, and a drive rack with arcuate cutouts, wherein the drive mechanism and the drive wheel are attached to the housing, the drive rack is attached to one of a transport carriage of the transport device and the holder device, and the bolts are configured to engage the arcuate cutouts of the drive rack.

22. (Amended) The apparatus of claim 21, wherein the drive rack, the transport rack of the transport device, and a holder rack of the holder device are shaped with a common periodic pitch.

23. (Amended) The apparatus of claim 1, wherein the holder device is guided by the transport device along a linear travel path.

24. (Amended) The apparatus of claim 1, wherein the holder device

is guided by the transport device along a circular travel path.

25. (Amended) The apparatus of claim 1, wherein each receptacle has a bottom surface marked with a receptacle code, and the transport device has a sensor head, and wherein signal-conducting means are provided for transmitting a code signal from the receptacle code to the sensor head.

26. (Amended) The apparatus of claim 1, wherein the holder device is marked with a holder device code and the transport device comprises:

a sensor device that is operable to read the holder device code and is arranged at an even level with the holder device code.

27. (Amended) A transport device operable to transport a plurality of receptacles containing a pourable substance to a measuring device, wherein the transport device comprises:

a holder device in which receptacles are seated so that they center themselves and can be individually handled, the holder device being configured for transport in the transport device and comprising means for damping a movement of the receptacles when they are displaced from an equilibrium position by an extraneous influence; and

means for delivering to and subsequently removing from the measuring device one after another of the receptacles in a manner, where removal of one receptacle and the delivery of a next following receptacle

occur simultaneously.

28. (Amended) The transport device of claim 27, wherein the receptacles are seated in the holder deviceat equally spaced positions with a defined distance from each other.

29. (Amended) The apparatus of claim 27, wherein the receptacles have a geometrically shaped cross-section of one of a circle, oval and rectangle.

30. (Amended) The apparatus of claim 27, wherein the holder device comprises:

a holder rack with indentations in which the receptacles are seated by means of rigid suspension members that are attached to upper ends of the receptacles.

31. (Amended) The apparatus of claim 30, wherein the rigid suspension members comprise:

sockets that partially surround a circumference of each receptacle , and rod members with an inner cone and an outer cone.

32. (Amended) The apparatus of claim 31, wherein at least one of the rod members further has a double cone which includes two cones pointing in opposite directions, located between the inner cone and the outer cone, and

forming a ring groove at a transition from the double cone to the outer cone, said ring groove serving to positively seat one of the rigid suspension members in one of the indentations of the holder rack.

33. (Amended) The apparatus of claim 27, wherein the holder device is separable from the transport device.

34. (Amended) The apparatus of claim 27, wherein the holder device has a cover as a barrier against contamination and evaporation.

35. (Amended) The apparatus of claim 27, wherein the holder device has at least one tub near openings of the receptacles, wherein the tub can be filled with a test liquid to create a saturated atmosphere in the holder device to reduce evaporation of the test liquid from the receptacles.

36. (Amended) The apparatus of claim 27, wherein the holder device has means whereby an underside of the holder device is sealed when the holder device is set on a flat surface.

37. (Amended) The apparatus of claim 27, wherein the transport device is operable to move the holder device horizontally back and forth while at the same time raising and lowering the holder device.

38. (Amended) The apparatus of claim 37, wherein the transport device is configured to move the holder device back and forth with

simultaneous raising and lowering with a single drive source.

40. (Amended) The apparatus of claim 27, wherein the transport devicehas a transport carriage and a transport channel in which the transport carriage moves, and wherein the transport carriage has a seat for the holder device.

41. (Amended) The apparatus of claim 27, wherein the transport device comprises:

at least one transport rack guiding movements of the holder device.

42. (Amended) The apparatus of claim 27, wherein the transport device comprises:

a position sensor operable to determine an actual position of one of the holder device and a transport carriage of the transport device in relation to the transport device.

43. (Amended) The apparatus of claim 38, comprising:

a drive mechanism, a housing, a drive wheel with at least two bolts, and a drive rack with arcuate cutouts, wherein the drive mechanism and the drive wheel are attached to the housing, the drive rack is attached to one of a transport carriage of the transport device and the holder device, and the bolts

are configured to engage the arcuate cutouts of the drive rack.

44. (Amended) The apparatus of claim 43, wherein the drive rack, the transport rack of the transport device, and a holder rack of the holder device are shaped with a common periodic pitch.

45. (Amended) The apparatus of claim 27, wherein the holder device is guided by the transport device along a linear travel path.

46. (Amended) The apparatus of claim 27, wherein the holder device is guided by the transport device along a circular travel path.

47. (Amended) The apparatus of claim 27, wherein each receptacle has a bottom surface marked with a receptacle code, and the transport device has a sensor head, and wherein signal-conducting means are provided for transmitting a code signal from the receptacle code to the sensor head.

48. (Amended) The apparatus of claim 27, wherein the holder device is marked with a holder device code and the transport device comprises:

a sensor device that is operable to read the holder device code and is arranged at an even level with the holder device code.

**REMARKS**

The claims have been amended to place the application in a more suitable form prior to examination. Favorable consideration is respectfully requested.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: _____
Patrick C. Keane
Registration No. 32,858

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

Date: January 10, 2002

**Attachment to Preliminary Amendment**

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Page 1, Paragraph Beginning at Paragraph No. 0001

BACKGROUND [OF THE INVENTION]

--Field Of The Invention:--

**[0003]** The invention relates to an apparatus to calibrate multi-channel pipettes by means of a measuring device, and it also relates to a device for transporting receptacles containing a test liquid to a measuring device.

--Background Information--

**[0004]** Pipettes are instruments for transferring defined amounts of liquids from one container to another and are used in particular in laboratories. The dispensing of liquids by means of pipettes is often the first step in a series of analytical experiments. Multi-channel pipettes are particularly efficient to work with, because they allow liquid to be aspirated simultaneously from one or more containers and to be dispensed into several receptacles at once. It is of particular importance that the volume of liquid taken in and dispensed to other containers is the same in all channels. In view of the strict requirements on the accuracy of the transferred volume, pipettes used for the foregoing purpose, especially multi-channel pipettes, have to be tested several times in the course of a year. In addition, verification tests of pipettes are required under official guidelines and international standards. A verification test is often referred to as a calibration.

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Page 3, Paragraph Beginning at Paragraph No. 0006

[OBJECT OF THE INVENTION]

--SUMMARY OF THE INVENTION--

**[0006]** The present invention therefore has the objective of providing an apparatus for the gravimetric calibration of multi-channel pipettes with a transport device that advances the receptacles to the measuring device. The apparatus should have an uncomplicated design that causes no loss of precision of the calibration measurements, can be realized at a favorable cost, and has a faster operating speed, so that a multi-channel pipette can be calibrated in a reasonable amount of time.

[SUMMARY OF THE INVENTION]

**[0007]** An apparatus for the gravimetric calibration of multi-channel pipettes according to the present invention contains a balance that has a load receiver configured to support receptacles containing a substance to be weighed. The apparatus has a holder device to support a certain number of the receptacles into which a test liquid is dispensed from the multi-channel pipette. The apparatus further has a transport device for advancing the holder device towards the load receiver. The receptacles are seated in the holder device at equally spaced positions with a defined distance from each other. The transport device has means whereby one after another of the receptacles can be delivered to and subsequently removed from the measuring device.

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Page 6, Paragraph Beginning at Paragraph No. 0023

**[0023]** In the attached drawing:

**[0024]** Fig. 1 represents an overall view of [the] an exemplary transport device according to the invention;

**[0025]** Fig. 2 represents [a preferred] an exemplary embodiment of a holder device for [the] receptacles in a perspective view;

**[0026]** Fig. 3 represents a top view of four different exemplary embodiments of receptacles A through D with their suspension members;

**[0027]** Fig. 4 represents a perspective view of an exemplary alternative design of the suspension members, particularly suitable for narrow receptacles;

**[0028]** Fig. 5 represents a perspective view of [the] an exemplary transport rack and [the] transport container, shown spatially separated from each other;

**[0029]** Fig. 6 represents a sectional view of an exemplary embodiment of [the] a load receiver inside the holder device with a receptacle in place;

**[0030]** Fig. 7 represents [a preferred] an exemplary embodiment of the drive mechanism at [the] a lowest position of [the] a transport movement;

**[0031]** Fig. 8 illustrates in a detail view from the side [how the] an exemplary manner by which an exemplary transport device and [the] load receiver work together;

**[0032]** Fig. 9 represents a cross-sectional view of [the] an exemplary holder device;

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**[0033]** Fig. 10 represents an exemplary integrated code reader arrangement near the load receiver, with code markings attached to the bottoms of the receptacles; and

**[0034]** Fig. 11 represents a perspective view of [the] an exemplary transport device with a bar code marking on the holder device and a bar code reader mounted on the transport device.



Page 7, Paragraph Beginning at Paragraph No. 0035

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

**[0035]** An apparatus for the gravimetric calibration of multi-channel pipettes [consists of] includes an electronic balance with a load receiver, a holder device, and a transport device for receptacles. Fig. 1 illustrates a transport device 1 with a housing 2, and a transport channel 5 running along the center of the housing 2. Transport racks 7 run near the top of the inward-facing side walls 3 of the channel 5. The bottom side 4 of each transport rack has a profile resembling a sine wave with truncated wave tops. The sine-wave profile could for example be formed as a machined recess in each side wall 3, in which case the latter would be made of a thicker material. Alternatively, the sine-wave profile could be part of a rail that is set into the side wall 3. The transport rack 7 is delimited at the top by an upper rack profile 6 in the shape of arches, with the highest points of the arches lying opposite the truncated wave tops of the bottom side 4. A transport carriage 8 is movable in the transport channel, guided by the transport racks 7, as

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will be described in more detail in the context of Fig. 5. A holder device 10, which could also be called a holding frame, has a foot portion 11 that is seated with a snug fit in a seat 12, e.g. a cut-out, of the transport carriage 8. No additional fastener device is needed to keep the holder device 10 positioned on the transport carriage 8. A cover 9 is set over the holder device 10.

**[0036]** Fig. 2 gives a perspective view, looking from above at an oblique angle at the holder device 10 with the receptacles 13 for the test medium (usually water). In addition, Fig. 2 also shows the cover 9, likewise in perspective, looking at the underside of the cover 9. The holder device 10 [consists of] includes an oblong T-shaped arrangement of three major parts. The side walls 14 extend from the foot portion 11 almost to the upper edge of the holder device 10. Tubs 15 are arranged on the outside of both side walls 14. The tubs 15 are filled with the same liquid as is used to test the pipettes (normally water), or they contain water-saturated sponges. Their purpose is to saturate the air inside the holder device 10 with humidity to counteract the evaporation of the test liquid in the receptacles 13. A humidity sensor installed close to the tubs 15 may be used to verify the degree of saturation. The side walls 14 have serrated upper rims forming a holder rack 16. The tips 17 and triangular indentations 18 in the rim of one side wall 14 are symmetrically aligned with the tips and indentations of the other side wall 14. The indentations of the holder rack 16 serve as seats for the receptacles 13. The latter are suspended by means of suspension members 19, 19' that are seated in the indentations 18 of the holder rack 16. A

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series of receptacles 13 are seated in this manner one after the other in adjacent indentations. The holder device 10 is open at the bottom. However, if the holder device 10 is set down on a plane surface, e.g., on the floor 60 of the transport channel (see Fig. 1), the bottom of the holder device 10 is closed off so that no air, and thus no humidity, is exchanged with the ambient atmosphere.

**Attachment to Preliminary Amendment**

**Marked-up Claims**

1. (Amended) An apparatus for gravimetrically calibrating a multi-channel pipette, comprising:

a balance [(37)] with a load receiver [(38)] configured to support one of a plurality of receptacles [(13),];

a holder device [(10)] configured to hold the plurality of receptacles [(13)], said receptacles being seated in the holder device [(10)] at defined equal intervals from each other and arranged so that the receptacles can be filled with a test liquid from pipette tips of the multi-channel pipette[,]; and

a transport device [(1)] for transporting the holder device [(10)] to the load receiver [(38)], wherein the transport device [(1)] has means [whereby] for placing on and subsequently removing from the load receiver one after another of said receptacles [(13) can be placed on and subsequently removed from the load receiver (38)].

2. (Amended) The apparatus of claim 1, wherein at least one of the transport device [(1)] and the holder device [(10)] has means for precisely positioning the receptacles [(13)] on the load receiver [(38)].

3. (Amended) The apparatus of claim 1, wherein the transport device [(1)] is encased in a housing [(2)], the balance [(37)] is installed in the housing [(2)], and the

**Attachment to Preliminary Amendment**

**Marked-up Claims**

load receiver [(38)] is arranged on [top] a surface of the balance and passes [upward] through an opening [(40)] of the housing [(2)] into the holder device [(10)], when the [latter] holder device is in a working position on the transport device [(1)].

4. (Amended) The apparatus of claim 1, wherein the load receiver [(38)] has two wings [(39)] with V-shaped depressions [(41)] formed at [upper] ends of the wings [(39)], from which said one of the plurality of receptacles [(13)] can be suspended.

5. (Amended) The apparatus of claim 1, wherein the defined equal intervals correspond to a tip interval at which the pipette tips of the multi-channel pipette are spaced from each other.

6. (Amended) The apparatus of claim 1, wherein the plurality of receptacles [(13)] in the holder device [(10)] has at least as many receptacles [(13)] as the multi-channel pipette has pipette tips.

7. (Amended) The apparatus of claim 1, wherein the receptacles [(13)] have a geometrically shaped cross-section of one [of the geometric shapes known as] a [circles, ovals and rectangles] circle, oval and rectangle.

8. (Amended) The apparatus of claim 1, wherein the holder device [(10)] comprises:

**Attachment to Preliminary Amendment**

**Marked-up Claims**

a holder rack [(16)] with indentations [(18)] in which the receptacles [(13)] are seated by means of rigid suspension members [(19, 19')] that are attached to upper ends of the receptacles [(13)].

9. (Amended) The apparatus of claim 8, wherein the rigid suspension members [(19, 19')] comprise:

sockets that partially surround a circumference of [the] each receptacle [(13)], and rod members [(24, 24')] with an inner cone [(25)] and an outer cone [(26)].

10. (Amended) The apparatus of claim 9, wherein at least one of the rod members [(24, 24') further] has a double cone [(27) consisting of] which includes two cones pointing in opposite directions, located between the inner cone [(25)] and the outer cone [(26)], and forming a ring groove [(28)] at a transition from the double cone [(27)] to the outer cone [(26)], said ring groove [(28)] serving to positively seat one of the rigid [the] suspension [member (19)] members in one of the indentations [(18)] of the holder rack [(16)].

11. (Amended) The apparatus of claim 1, wherein the holder device [(10)] is separable from the transport device [(1)].

12. (Amended) The apparatus of claim 1, wherein the holder device [(10)]

**Attachment to Preliminary Amendment**

**Marked-up Claims**

has a cover [(9)] as a barrier against contamination and evaporation.

13. (Amended) The apparatus of claim 1, wherein the holder device [(10)] has at least one tub [(15)] near openings of the receptacles [(13)], wherein the tub [(15)] can be filled with the test liquid to create a saturated atmosphere in the holder device [(10) and thereby] to reduce evaporation of the test liquid from the receptacles [(13)].

14. (Amended) The apparatus of claim 1, wherein the holder device [(10)] has means whereby an underside of the holder device [(10)] is sealed when the holder device [(10)] is set on a flat surface.

15. (Amended) The apparatus of claim 1, wherein the transport device [(1)] is operable to move the holder device [(10)] horizontally back and forth while at the same time raising and lowering the holder device [(10)].

16. (Amended) The apparatus of claim 15, wherein the transport device [(1)] is configured to [perform said] move the holder device back and forth [movements] with simultaneous raising and lowering with a single drive source.

18. (Amended) The apparatus of claim 1, wherein the transport device [(1)] has a transport carriage [(8)] and a transport channel [(5)] in which the transport carriage [(8)] moves, and wherein the transport carriage [(8)] has a seat [(12)] for the

**Attachment to Preliminary Amendment**

**Marked-up Claims**

holder device [(10)].

19. (Amended) The apparatus of claim 1, wherein the transport device [(1)] comprises:

at least one transport rack [(7)] guiding [said] movements of the holder device [(10)].

20. (Amended) The apparatus of claim 1, wherein the transport device [(1)] comprises:

a position sensor operable to determine an actual position of one of the holder device [(10)] and [the] a transport carriage of the transport device [(8)] in relation to the transport device [(1)].

21. (Amended) The apparatus of claim 16, comprising:

a drive mechanism [(35)], a housing [(2)], a drive wheel [(51)] with at least two bolts [(52)], and a drive rack [(36)] with arcuate cutouts, wherein the drive mechanism [(35) with] and the drive wheel [(51) is] are attached to the housing [(2)], the drive rack [(36)] is attached to one of [the] a transport carriage of the transport device [(8)] and the holder device, [(10)] and the bolts [(52)] are configured to engage the arcuate cutouts of the drive rack [(36)].

22. (Amended) The apparatus of claim 21, wherein the drive rack [(36)], the

**Attachment to Preliminary Amendment**

**Marked-up Claims**

transport rack [(7)] of the transport device, and [the] a holder rack of the holder device [(16)] are shaped with a common periodic pitch.

23. (Amended) The apparatus of claim 1, wherein the holder device [(10)] is guided by the transport device [(1)] along a linear travel path.

24. (Amended) The apparatus of claim 1, wherein the holder device [(10)] is guided by the transport device [(1)] along a circular travel path.

25. (Amended) The apparatus of claim 1, wherein each receptacle [(13)] has a bottom surface [(62)] marked with a receptacle code [(46)], and the transport device [(1)] has a sensor head [(47)], and wherein signal-conducting means [(48)] are provided for transmitting a code signal from the receptacle code [(46)] to the sensor head [(47)].

26. (Amended) The apparatus of claim 1, wherein the holder device [(10)] is marked with a holder device code [(49)] and the transport device [(1)] comprises:

a sensor device [(50)] that is operable to read the holder device code [(49)] and is arranged at an even level with the holder device code.

27. (Amended) A transport device [(1)] operable to transport a plurality of receptacles [(13)] containing a pourable substance to a measuring device, wherein[:
-] the transport device [(1)] comprises:

**Attachment to Preliminary Amendment**

**Marked-up Claims**

a holder device [(10)] in which [the] receptacles [(13)] are seated so that they center themselves and can be individually handled[; -], the holder device [(10) is] being configured for [being transported] transport in the transport device [(10);] and comprising

[- the holder device [(10)] comprises] means for damping a movement of the receptacles [(13) if] when they are displaced from an equilibrium position by an extraneous influence; and

[- the transport device [(1)] comprises] means for delivering to and subsequently removing from the measuring device [whereby] one after another of the receptacles [(13) can be delivered to and subsequently removed from the measuring device] in a manner, where [the] removal of one receptacle [(13)] and the delivery of a next following receptacle [(13)] occur simultaneously.

28. (Amended) The transport device of claim 27, wherein the receptacles [(13)] are seated in the holder device [(10)] at equally spaced positions with a defined distance from each other.

29. (Amended) The apparatus of claim 27, wherein the [measuring] receptacles [(13)] have a geometrically shaped cross-section of one of [the geometric shapes known as circles, ovals and rectangles] a circle, oval and rectangle.

30. (Amended) The apparatus of claim 27, wherein the holder device [(10)]

**Attachment to Preliminary Amendment**

**Marked-up Claims**

comprises:

a holder rack [(16)] with indentations [(18)] in which the receptacles [(13)] are seated by means of rigid suspension members [(19, 19')] that are attached to upper ends of the receptacles [(13)].

31. (Amended) The apparatus of claim 30, wherein the rigid suspension members [(19, 19')] comprise:

sockets that partially surround a circumference of [the] each receptacle [(13)], and rod members [(24, 24')] with an inner cone [(25)] and an outer cone [(26)].

32. (Amended) The apparatus of claim 31, wherein at least one of the rod members [(24, 24')] further has a double cone [(27) consisting of] which includes two cones pointing in opposite directions, located between the inner cone [(25)] and the outer cone [(26)], and forming a ring groove [(28)] at a transition from the double cone [(27)] to the outer cone [(26)], said ring groove [(28)] serving to positively seat one of the rigid [the] suspension [member (19)] members in one of the indentations [(18)] of the holder rack [(16)].

33. (Amended) The apparatus of claim 27, wherein the holder device [(10)] is separable from the transport device [(1)].

**Attachment to Preliminary Amendment**

**Marked-up Claims**

34. (Amended) The apparatus of claim 27, wherein the holder device [(10)] has a cover [(9)] as a barrier against contamination and evaporation.

35. (Amended) The apparatus of claim 27, wherein the holder device [(10)] has at least one tub [(15)] near openings of the receptacles [(13)], wherein the tub [(15)] can be filled with [the] a test liquid to create a saturated atmosphere in the holder device [(10) and thereby] to reduce evaporation of the test liquid from the receptacles [(13)].

36. (Amended) The apparatus of claim 27, wherein the holder device [(10)] has means whereby an underside of the holder device [(10)] is sealed when the holder device [(10)] is set on a flat surface.

37. (Amended) The apparatus of claim 27, wherein the transport device [(1)] is operable to move the holder device [(10)] horizontally back and forth while at the same time raising and lowering the holder device [(10)].

38. (Amended) The apparatus of claim 37, wherein the transport device [(1)] is configured to [perform said] move the holder device back and forth [movements] with simultaneous raising and lowering with a single drive source.

40. (Amended) The apparatus of claim 27, wherein the transport device [(1)] has a transport carriage [(8)] and a transport channel [(5)] in which the transport

**Attachment to Preliminary Amendment**

**Marked-up Claims**

carriage [(8)] moves, and wherein the transport carriage [(8)] has a seat [(12)] for the holder device [(10)].

41. (Amended) The apparatus of claim 27, wherein the transport device [(1)] comprises:

at least one transport rack [(7)] guiding [said] movements of the holder device [transport receptacle (10)].

42. (Amended) The apparatus of claim 27, wherein the transport device [(1)] comprises:

a position sensor operable to determine an actual position of one of the holder device [(10)] and [the] a transport carriage of the transport device [(8)] in relation to the transport device [(1)].

43. (Amended) The apparatus of claim 38, comprising:

a drive mechanism [(35)], a housing [(2)], a drive wheel [(51)] with at least two bolts [(52)], and a drive rack [(36)] with arcuate cutouts, wherein the drive mechanism [(35) with] and the drive wheel [(51) is] are attached to the housing [(2)], the drive rack [(36)] is attached to one of [the] a transport carriage of the transport device [(8)] and the holder device, [(10)] and the bolts [(52)] are configured to engage the arcuate cutouts of the drive rack [(36)].

**Attachment to Preliminary Amendment**

**Marked-up Claims**

44. (Amended) The apparatus of claim 43, wherein the drive rack [(36)], the transport rack of the transport device [(7)], and [the] a holder rack of the holder device [(16)] are shaped with a common periodic pitch.

45. (Amended) The apparatus of claim 27, wherein the holder device [(10)] is guided by the transport device [(1)] along a linear travel path.

46. (Amended) The apparatus of claim 27, wherein the holder device [(10)] is guided by the transport device [(1)] along a circular travel path.

47. (Amended) The apparatus of claim 27, wherein each receptacle [(13)] has a bottom surface [(62)] marked with a receptacle code [(46)], and the transport device [(1)] has a sensor head [(47)], and wherein signal-conducting means [(48)] are provided for transmitting a code signal from the receptacle code [(46)] to the sensor head [(47)].

48. (Amended) The apparatus of claim 27, wherein the holder device [(10)] is marked with a holder device code [(49)] and the transport device [(1)] comprises:

a sensor device [(50)] that is operable to read the holder device code [(49)] and is arranged at an even level with the holder device code.

## ABSTRACT OF THE DISCLOSURE

An apparatus for the gravimetric calibration of multi-channel pipettes contains a balance that has a load receiver configured to support receptacles containing a substance to be weighed. The apparatus has a holder device to support a certain number of the receptacles into which a test liquid is dispensed from the multi-channel pipette. The apparatus further has a transport device for advancing the holder device towards the load receiver. The receptacles are seated in the holder device at equally spaced positions and are one by one delivered to and subsequently removed from the measuring device.